Public Safety Interoperable Communications and the 700 MHz D Block Proceeding

06-229
06-150

Testimony for FCC En Banc Hearing

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July 30, 2008

Thank you for inviting me to testify on the building of a nationwide, broadband interoperable public safety network. I am honored to provide my analysis of a topic I first worked on as Chief Technologist at the FCC in 1999 and then advocated and pursued as CTO of Frontline Wireless last year.

Pursuit of a public safety wireless broadband network is a very complex problem with many hard technical and operational choices. These choices **critically** affect the basic viability of the network and make a difference of billions of dollars in capex and operations expenses . The failed 700 Mhz D Block Auction did not yield a process that enabled these choices to be made. The diversity of recent filings shows even less consensus on these difficult choices. If there is one single point I could convey it is this: The FCC must lead an industry process to synthesize these diverse financial and technical viewpoints so that the Commission, the Public Safety community, and the telecommunications industry can make the tough choices needed for a successful rulemaking.

To make these key choices, the FCC must clearly define the priority problems to be solved in the upcoming rulemaking. I submit that priority one is building the broadband wireless capabilities needed for first responders. The FCC should not be diverted from that focus by, for example, the uneconomic "pipe dream" of creating a wireless broadband alternative to compete with DSL and cable, which would realistically require in excess of 100 MHz of prime spectrum.

Let's look at an examples of the tough decisions that must be the focus of the current rulemaking. Service and technical requirements critically affect the economic viability of any solution. The single biggest driver of costs is cell sites. The number of cell sites is driven by coverage and capacity requirements. In addition to the geographic or population coverage requirement, more subtle technical factors that determine cell size and hence the number of cell sites include:

- Type of subscriber devices to be supported at the cell edge (e.g. high power high-gain devices versus small handhelds)
- In-building or outdoor coverage
- And the all-important minimum acceptable cell edge speed

To illustrate how critical these parameters are, consider a network design commissioned by Frontline Wireless for the state of North Carolina with input from law enforcement (filed as Appendix B). Today NC has a great low speed interoperable statewide date network. The network design commissioned by Frontline would provide broadband services with the following key parameters:

- a cell edge speed of 300 kbps downlink and 75 kbps uplink
- coverage footprint performance better than the combination of
    - the current commercial cellular footprint

  and

    - the current NC law enforcement data network designed to provide service to a sheriff's high power data device almost any place a sheriff's car can drive to a roof mounted radio at the broadband speeds above

In this scenario deep in-building coverage would be provided by vehicular repeaters. These requirements are not necessarily the "right answer" but do illustrate the type of specific parameters that must be defined to understand network costs and performance.

Now suppose this network as advocated in some filings was required to support

- cell edge speed of 1.2 Mbps downlink and 512 kbps uplink
- coverage for law enforcement as above but to include signal strength for low-power handhelds well inside buildings

Then the network would need 2 to 4 times as many cell sites which translates into many many billions of additions expenses. The Commission must understand such technical and economic facts in order to make the tough choices.

Appendix A enumerates many other technical and service decisions that must be addressed in order to a have viable solution .

Tackling the tough requirements will be pointless if no companies step up to the task of building the public safety network capabilities. Making matters even more challenging, current industry changes – including the pending Verizon-Alltel merger, the New Clearwire joint venture, the Sprint Nextel turnaround, and the recently announced restructuring of Motorola – will significantly affect who are the likely players willing to step up to the plate. Therefore the Commission must understand the viability of different business or operating models for public safety broadband networks. Should it be

1. a dedicated government network,
2. a partnership model with the D Block,
3. or a priority service offered via a network of networks using wireless broadband access on advanced commercial networks?

The dedicated network would be most tailored to public safety's needs, but such a dedicated network, according to Verizon, would cost in excess $50 billion of dollars. The D block partnership failed in the last auction. So we must ask if, for this model, can the difficult choices be made so that public safety needs will be met and so that the commercial sector sees a viable business opportunity? We do note that, with new wireless technology, the PSBL partnership need not be confined to adjacent spectrum. The priorities services approach, which is used for wireline public safety networking today (e.g. 911), could potentially be the most cost-effective and provide the quickest solution in light of the new IP based 4G wireless networks. The key question for this case is under what incentives or mandates would commercial operators build their advanced cellular networks to meet unique public safety requirements for:

1. Features
2. Reliability
3. Wireless coverage far far more extensive than today's cellular networks

In conclusion, the decisions made by the FCC in this rulemaking will determine for decades to come if thousands of state and local public safety agencies will have the state-of-the-art communications needed to save lives and guard our infrastructure . To reach effective decisions the FCC must:

- understand public safety's requirements
- understand the technology issues
- understand the economic issues
- and understand the implications of pending industry changes

Last year's rulemaking process failed to provide the FCC the needed understanding. The FCC should consider creating a fact-finding council

of reputable technologists and economists representing the myriad stakeholders, including public safety, the manufacturers, and network operators. The FCC should charge this council with providing objective input on these complex issues.

Only with such input can the effective decisions be made that will lead to the building of the Nationwide Interoperable Broadband Network Capabilities our first responders and critical infrastructure providers need.

THANK YOU.